

Biofouling Management and In-Water Cleaning in California: Current Status



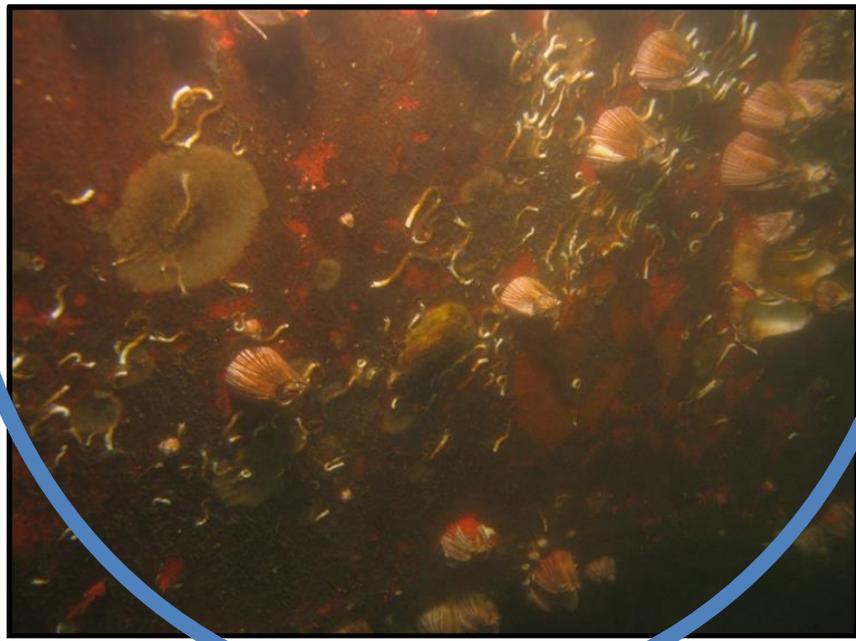
Chris Scianni
California State Lands Commission
Marine Invasive Species Program

Hawai'i In-Water Cleaning Workshop
June 22, 2015 – Honolulu, HI [Remote from CA]

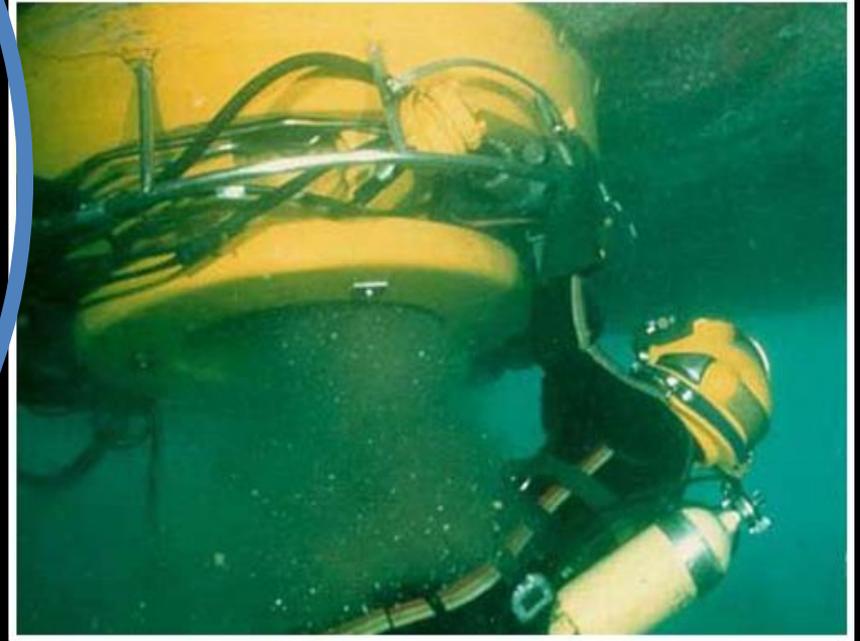


Regulatory Environment in California

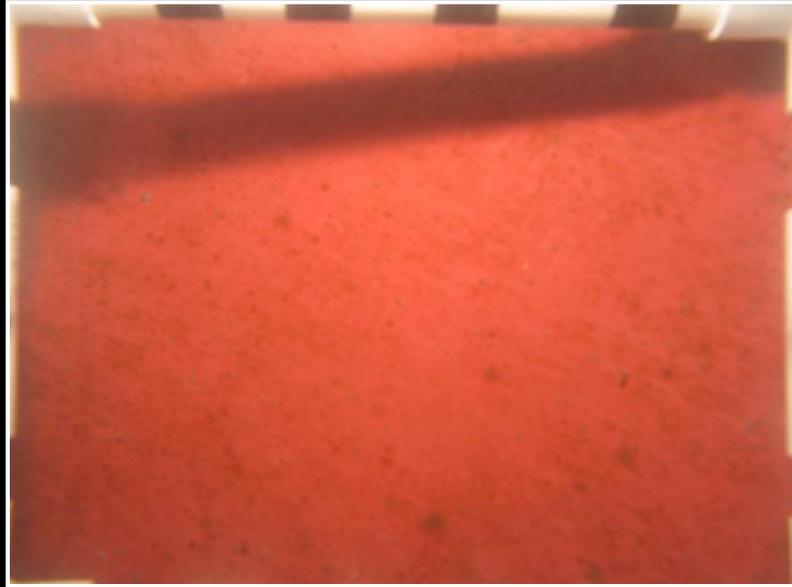
- Comprehensive Biofouling Management



- In-Water Cleaning



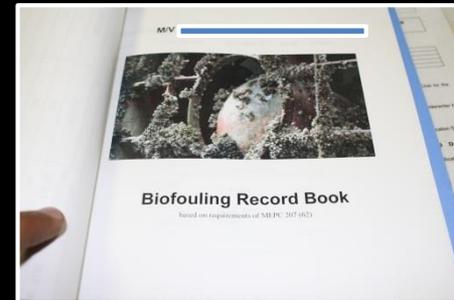
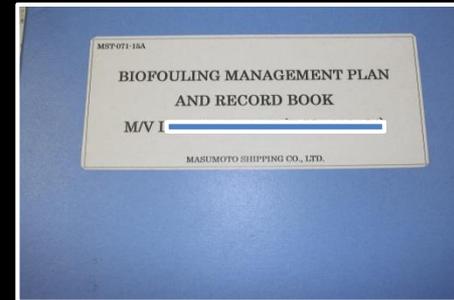
Proposed Biofouling Management Regulations



- Recordkeeping and reporting
- Best preventive practices
- Targeting high-risk ships

Proposed Biofouling Regulations: Recordkeeping and reporting

- Biofouling Management Plan
- Biofouling Record Book
- Hull Husbandry Reporting Form



California State Lands Commission
Marine Invasive Species Program
Hull Husbandry Reporting Form
Public Resources Code - 71295(a) and 71295(f)
June 6, 2016

Part I: Reporting Form

Vessel Name: _____
Official / IMO Number: _____
Responsible Officer's Name and Title: _____
Date Submitted (Day/Month/Year): _____

Hull Husbandry Information

1. Since delivery, has this vessel ever been removed from the water for maintenance?
Yes No

a. If Yes, enter the date and location of the most recent out-of-water maintenance:
Last date out of water (Day/Month/Year): _____
Port or Position: _____ Country: _____

b. If No, enter the delivery date and location where the vessel was built:
Delivery date (Day/Month/Year): _____
Port or Position: _____ Country: _____

2. Were the submerged portions of the vessel coated with an anti-fouling treatment or coating during the out-of-water maintenance or shipbuilding process listed above?
Yes, full coat applied
Yes, partial coat Date last full coat applied (Day/Month/Year) _____
No coat applied Date last full coat applied (Day/Month/Year) _____

3. For the most recent full coat application of anti-fouling treatment, what type of anti-fouling treatment was applied and to which specific sections of the submerged portion of the vessel was it applied?

Manufacturer/Company: _____
Product Name: _____
Applied on (Check all that apply): Hull Sides Hull Bottom Sea Chests
Sea Chest Gratings Propeller Rope Guard/Propeller Shaft
Previous Docking Blocks Thrusters Rudder Bilge Keels

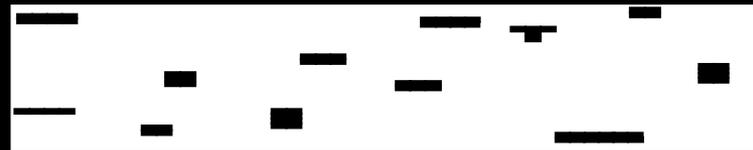
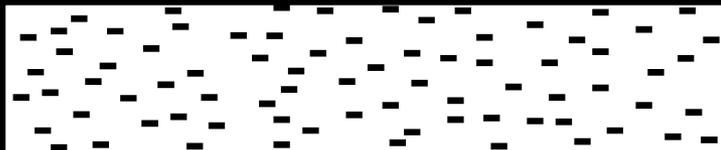
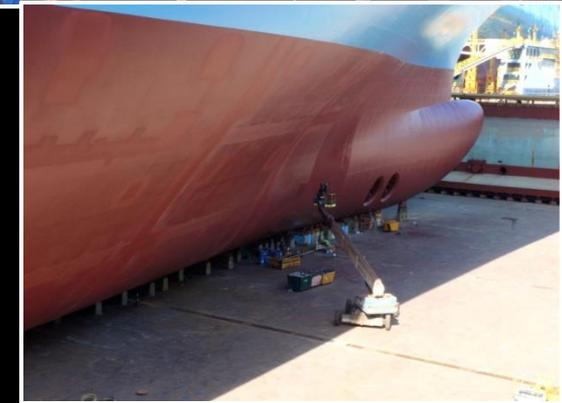
Proposed Biofouling Regulations: Biofouling Management – Niche Areas

- Manage in some way
- Document management actions



Proposed Biofouling Regulations: Biofouling Management - Hulls

- Codify best preventive practices:
 - Anti-fouling or foul-release coatings within effective lifespan
- If not using best preventive practices, 5% cover threshold



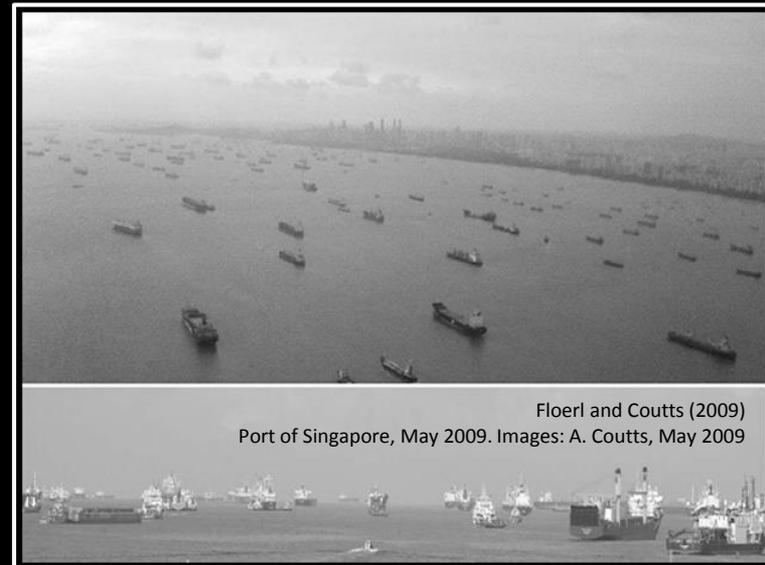
Proposed Biofouling Regulations: Obviously Excessive Biofouling

- Biofouling above 15% cover
 - Excessive drag, fuel, emissions
 - Greater risk of NIS introduction
- Hints at ineffective planning and/or coating
- Biofouling must be reduced to 5% cover or less



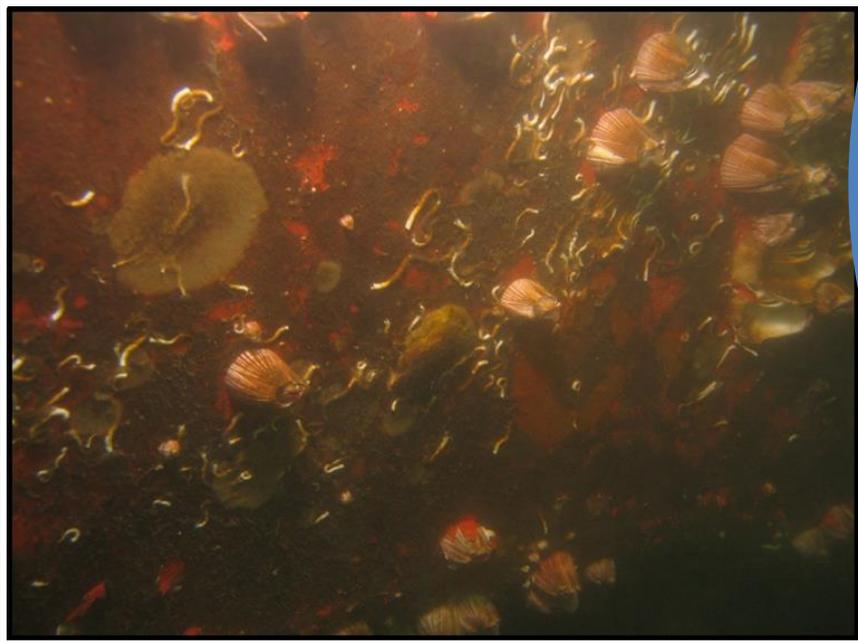
Proposed Biofouling Regulations: Extended Residency Periods

- Remaining in one location for 45+ days
- Greater likelihood of heavy biofouling accumulation
- Should inspect and clean (if necessary) prior to arrival at CA
 - Biofouling must be at or below 5% cover

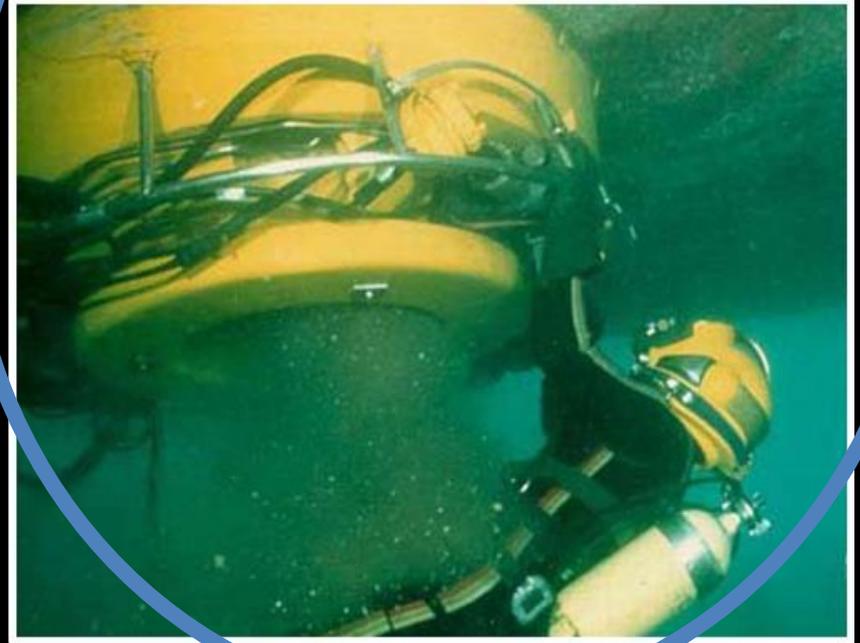


Regulatory Environment in California

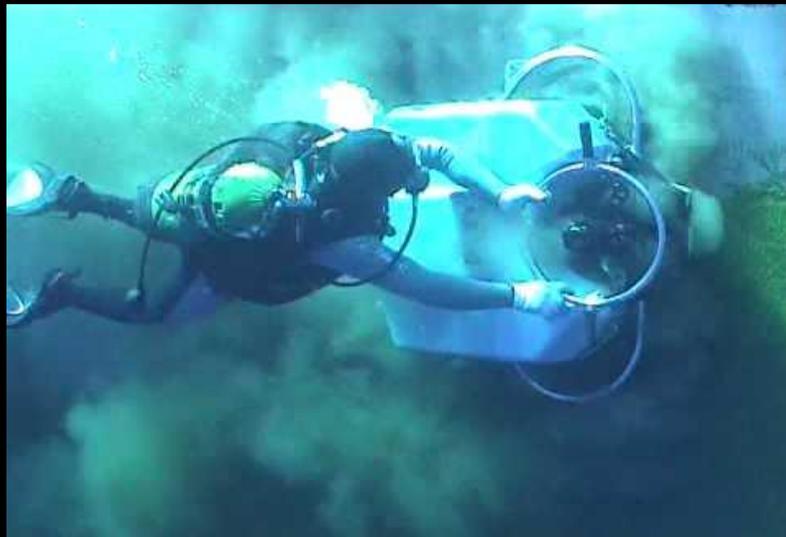
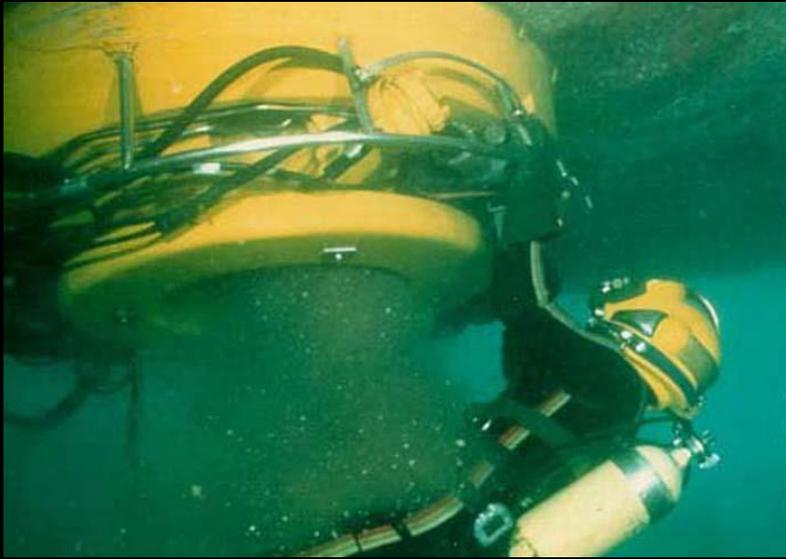
- Comprehensive Biofouling Management



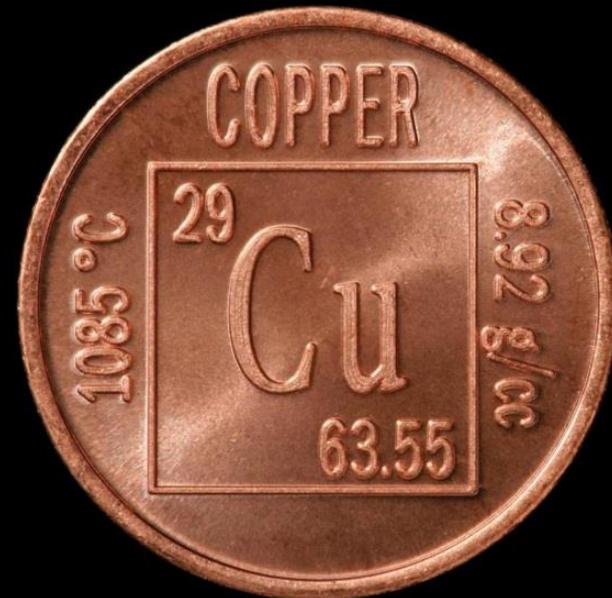
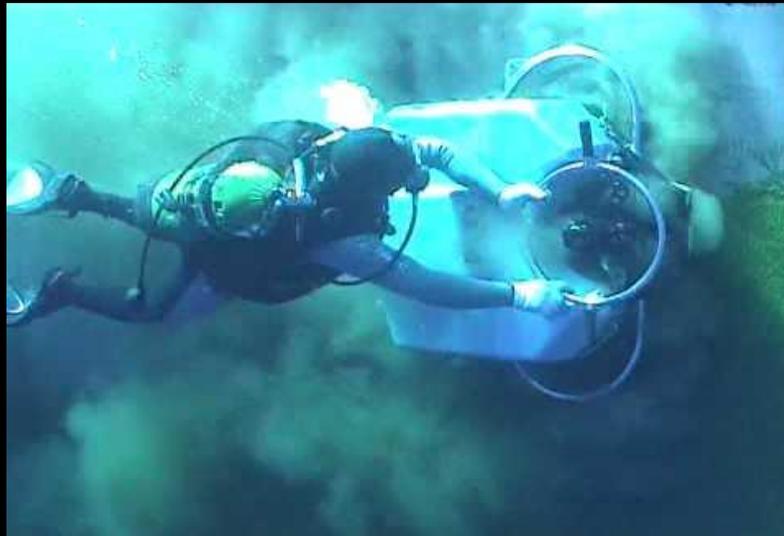
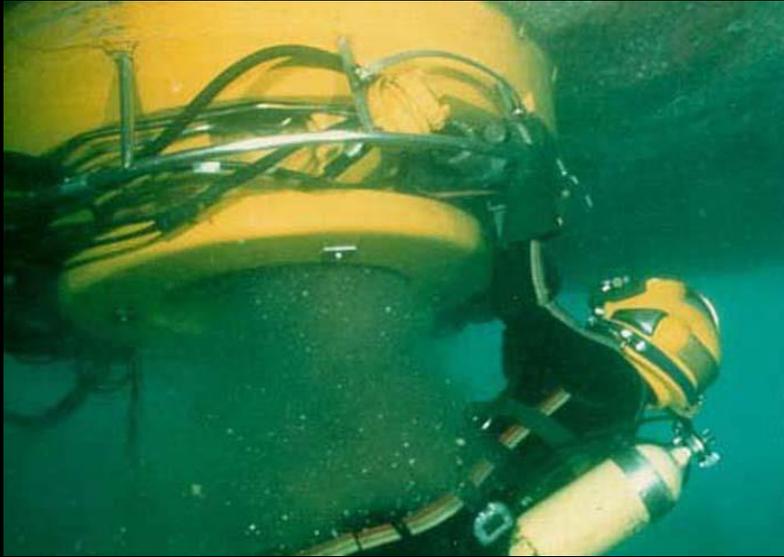
- In-Water Cleaning



What's the Concern? Nonindigenous Species



What's the Concern? Heavy Metal Pollution



What's the Concern?

Overlapping Jurisdiction



US: National Invasive Species Act



CA: Marine Invasive Species Act

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

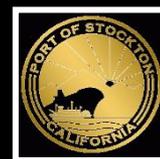
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD



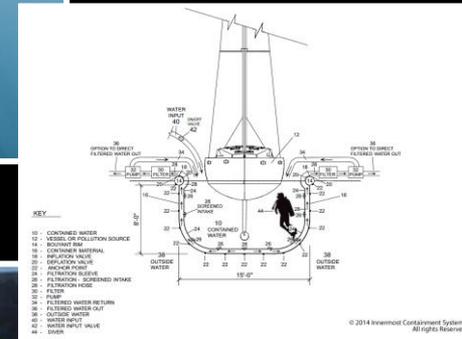
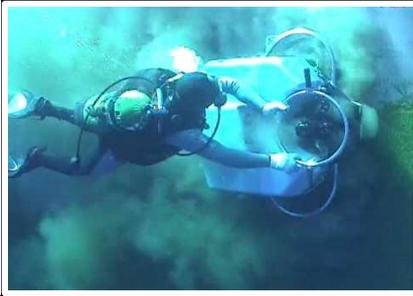
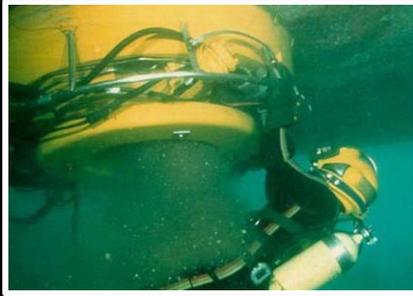
US: Clean Water Act/
Vessel General Permit



CA: Porter-Cologne Water Quality Control Act
US: Clean Water Act/Vessel General Permit



What's the Solution?



- New in-water cleaning technologies **(NO ENDORSEMENT IMPLIED)**
 - Collection/retention & filtration/treatment
 - Heat treatment



What's the Solution?

Cooperation and
collaboration



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

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Unified Port
of San Diego



Port of
Richmond



PORT of WEST SACRAMENTO
CLEAN MARINE DISTRIBUTION FOR CALIFORNIA'S HEARTLAND



**A Collaborative Panel
Discussion on the Present and
Future of In-Water Hull Cleaning
in California**

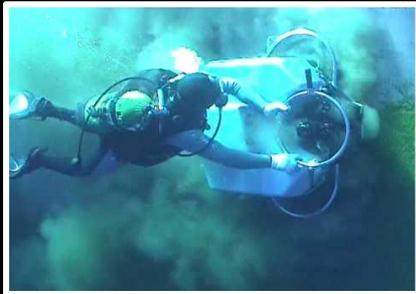
**Prevention First 2014
October 8, 2014
Long Beach, CA**

IWC: Where are we now?

- California's [State Water Resources Control Board] certification of Vessel General Permit
- EPA: Most/all new IWC technologies will fall outside of the scope of the VGP [next slide]

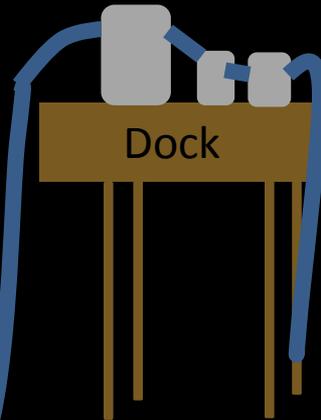
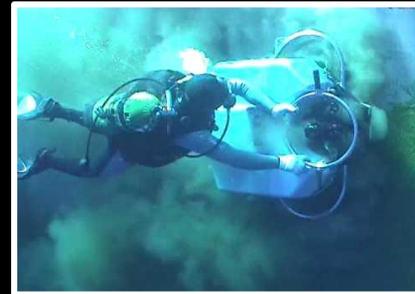
VGP coverage: Who owns the discharge?

Discharge is covered under Vessel General Permit



Discharge is NOT covered under Vessel General Permit

- Now essentially the IWC company's commercial discharge
- IWC company needs NPDES permit



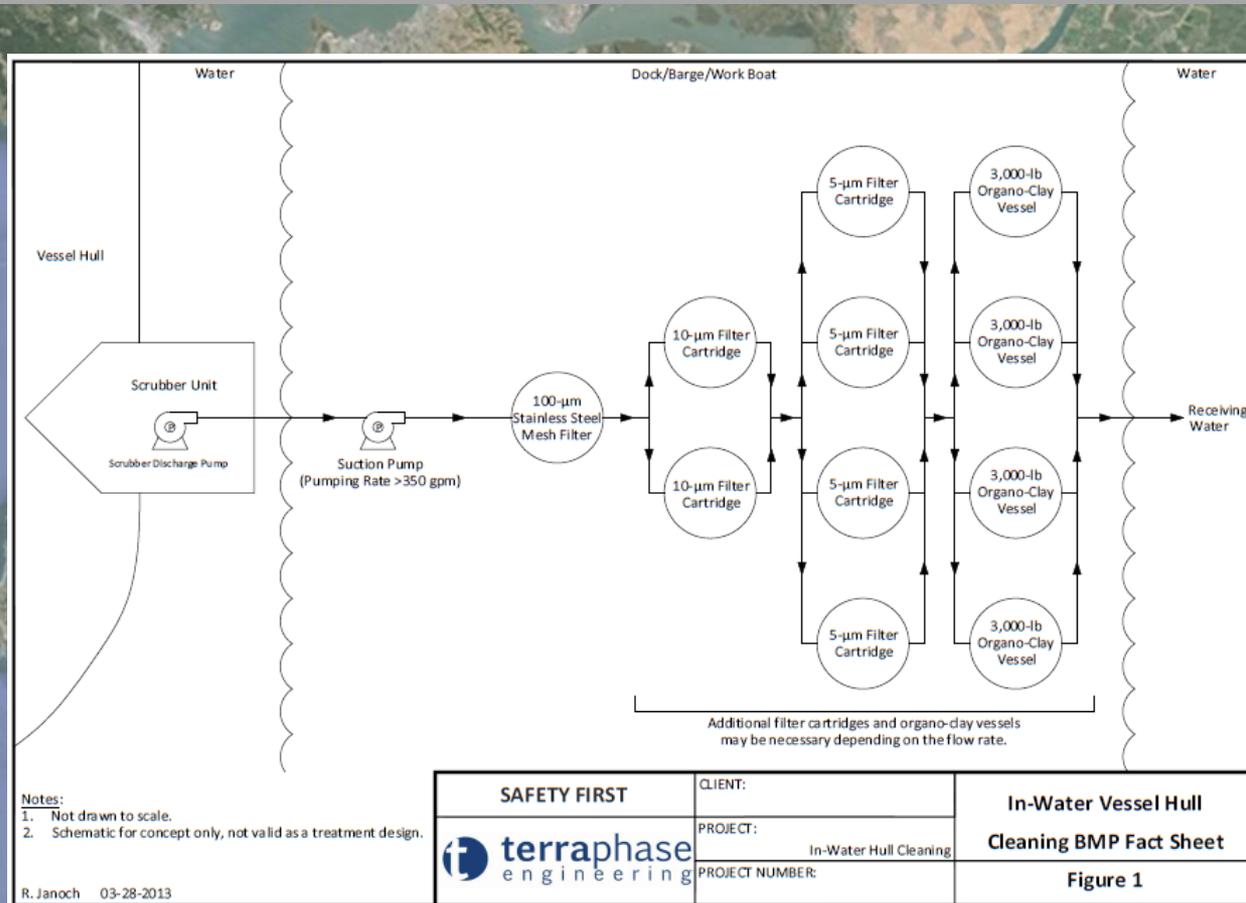
Disclaimer: This slide represents my understanding of the situation, after conversations with EPA staff. I do not represent nor speak for the EPA.

IWC: Where are we now?

- California's [State Water Resources Control Board] certification of Vessel General Permit
- EPA: Most/all new IWC technologies will fall outside of the scope of the VGP
- Local solutions:
 - San Francisco Bay Regional Water Quality Control Board
 - Los Angeles Regional Water Quality Control Board

San Francisco Bay Region

- 2012: US Maritime Administration (MARAD)-sponsored project



San Francisco Bay Region

- IWC Best Management Practice document

IN-WATER VESSEL HULL CLEANING

Best Management Practice

Fact Sheet – May 2015



Vessel hull cleaning in dry dock is the preferred hull cleaning method to minimize the impact of biocides and fouling organisms to surface waters, when technically and economically feasible, regardless of the vessel hull's coating system.

The U.S. Environmental Protection Agency's 2008 and 2013 Vessel General Permits prohibit in-water vessel hull cleaning in California unless conducted using Best Available Technology (BAT) as determined by California State Water Resources Control Board staff. Since the State Water Board has not yet determined BAT for in-water hull cleaning, San Francisco Bay Regional Water Quality Control Board staff have prepared the following interim best management practice (BMP) for in-water hull cleaning. Until the State Water Board determines BAT for in-water hull cleaning, dischargers are encouraged to employ the following interim BMP, or a more environmentally protective practice. Failure to do so may result in unauthorized discharges of pollutants into waters of the United States and Regional Water Board enforcement.

This BMP should be employed when completing in-water hull cleaning on vessels with biocide-based coatings (to reduce the release of fouling organisms and biocides) and on vessels with biocide-free coatings (to reduce the release of fouling organisms). However, following this BMP is not required when cleaning vessels that utilize a biocide-free coating system and have not operated outside of the Golden Gate since their most recent dry docking.

INTERIM BMP

The interim BMP for in-water hull cleaning consists of a containment and collection system capable of collecting all process water generated during in-water hull cleaning and directing it to a treatment system (Figure 1). This interim BMP is not a mandatory treatment system. A different collection and treatment system capable of achieving the same or greater pollutant capture and removal is acceptable.

The interim BMP employs a scrubber unit with rotating plastic brushes to remove attached biological material from a vessel's hull. The scrubber unit is held against the hull with approximately 1,000-pounds of pressure per square foot by a self-contained propeller and an approximately 400-gallon-per-minute (gpm) pump on a pier or barge.

A suction line attached to the discharge outlet from the scrubber unit collects and directs the process water to the pier or barge, where it is filtered by a 100-micron stainless steel mesh screen, followed by two 10-micron filter cartridges in parallel, followed by four 5-micron filter cartridges in parallel, and lastly conveyed through four pressure vessels arranged in parallel, each containing 3,000 pounds of organo-clay. If necessary, additional pressure vessels can be used in series or in parallel to fully accommodate the flow rate and maximize pollutant removal. The discharge point into the receiving water should be a minimum of 10-feet below the water surface. If large liquid storage containers are available, process water can be treated and discharged in batches.

SYSTEM AND DISCHARGE MONITORING

The suction pump flow should be monitored continuously and recorded hourly to ensure that a minimum of 350 gpm (400 gpm is optimal) of process water is recovered from the scrubber unit. Treatment system influent and effluent samples should be collected daily and analyzed for total and dissolved copper and zinc. Sampling should begin three detention times (the treatment system volume divided by the flow rate) after commencing operations and continue daily until operations cease. After

sampling the influent, effluent samples should be collected following one additional detention time.

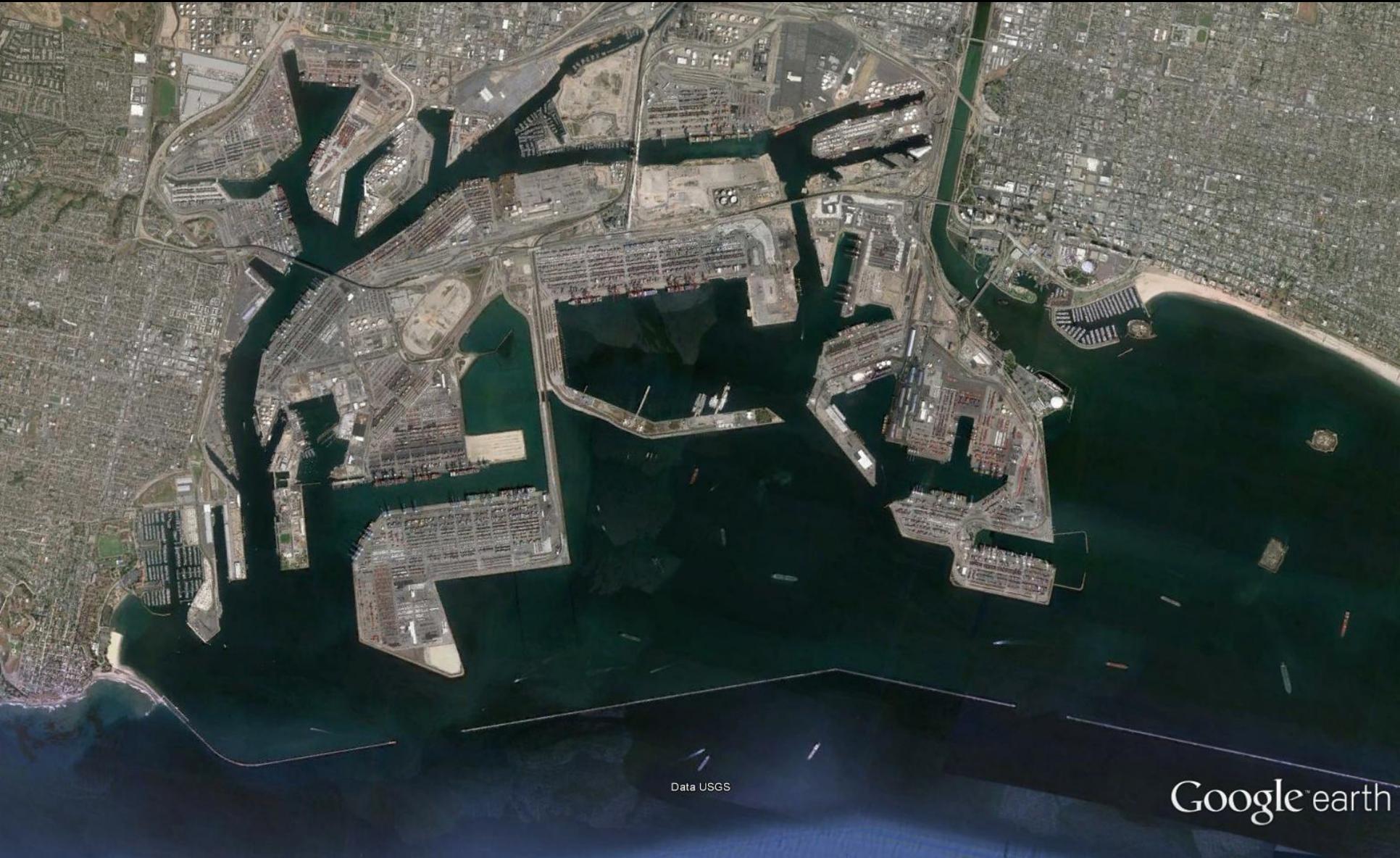
The analytic results should be submitted within 30 days of project completion to the San Francisco Bay Regional Water Board, Attn. David Elias, 1515 Clay St., Ste. 1400, Oakland, CA 94612. The analytic results should be accompanied by a detailed schematic of the treatment system employed. The results may be used in the future to determine BAT for in-water hull cleaning.

OPERATIONAL TRIGGERS

To ensure proper implementation of this interim BMP, or to confirm that another practice removes pollutants as well or better, treated process water discharged into the receiving water should not exceed a total copper concentration of 100-micrograms per liter ($\mu\text{g/L}$) nor a total zinc concentration of 700- $\mu\text{g/L}$. These triggers appear to be achievable and practicable. If monitoring results exceed these triggers, the treatment system should be modified or augmented to the extent possible to improve its performance until the triggers are achieved.

For questions, contact David Elias of the Regional Water Board at 510-622-2509 or delias@waterboards.ca.gov.

Los Angeles/Long Beach Region



Data USGS

Google earth

Los Angeles/Long Beach Region

- Listed as copper-impaired
 - Additional restrictions on copper discharge
- Several recent applications to LARWQCB for operations within ports
 - Petition for conducting trials this summer
- Copper standards are stringent

Wrap Up

- Still a complicated assemblage of parallel or competing mandates
 - Often with narrow authority
- Newer generation IWC technologies fall outside of VGP
 - In CA, requires separate NPDES permit
- Progress in testing and applications
 - Lots of interest, especially in LA/LB
- Current:
 - SF Bay = cleaning is possible, using BMP document
 - LA/LB = cleaning mostly occurring outside of ports, offshore

Thank You



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